Differential Effects of Adrenergic Antagonists (Carvedilol vs Metoprolol) on Parasympathetic & Sympathetic Activity: A Comparison of Measures

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BACKGROUND

Cardiovascular autonomic neuropathy (CAN) is recognized as a significant health risk, correlating with risk of heart disease, silent myocardial ischemia or sudden cardiac death. Beta-blockers are often prescribed to minimize risk.

OBJECTIVES

In this second of two articles, the effects on parasympathetic and sympathetic activity of the alpha/beta-adrenergic blocker, Carvedilol, are compared with those of the selective beta-adrenergic blocker, Metoprolol.

METHODS

Retrospective, serial autonomic nervous system test data from 147 type 2 diabetes mellitus patients from eight ambulatory clinics were analyzed.
Patients were grouped according to whether a beta-blocker was:
(1) introduced,
(2) discontinued or
(3) continued without adjustment.
Group 3 served as the control.

RESULTS

Introducing Carvedilol or Metoprolol decreased heart rate and blood pressure, and discontinuing them had the opposite effect. Parasympathetic activity increased with introducing Carvedilol. Sympathetic activity increased more after discontinuing Carvedilol, suggesting better sympathetic suppression. With ongoing treatment, resting parasympathetic activity decreased with Metoprolol but increased with Carvedilol.

CONCLUSION

Carvedilol has a more profound effect on sympathovagal balance than Metoprolol. While both suppress sympathetic activity, only Carvedilol increases parasympathetic activity. Increased parasympathetic activity may underlie the lower mortality risk with Carvedilol.